

**COLORADO RIVER RECOVERY PROGRAM
FY 2000 ANNUAL PROJECT REPORT**

**RECOVERY PROGRAM
PROJECT NUMBER:50**

- I. Project Title: A Five-Year Experimental Stocking Plan to Evaluate Survival of Various Sizes of Razorback Sucker**
- II. Principal Investigator(s):** Frank K. Pfeifer, Project Leader
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III. Project Summary:

The study goal is to 1) evaluate the relation between survival of captive-reared razorback sucker and size at release into the river, and 2) reintroduce razorback sucker in the Gunnison River that will result in 10 adult fish per river mile in suitable riverine habitat. The target is re-establish a population of about 600 adult razorback sucker from Austin, Colorado, downstream 68 river miles to the confluence with the Colorado River. Specific objectives include determining 1) the relationship between various sizes (4-, 8-, and 12-inch) of razorback sucker stocked and their subsequent survival in the wild, and 2) dispersal of stocked fish following release over time. Ultimately, the optimum size(s) of razorback sucker to be stocked into Upper Colorado River Basin rivers will be recommended.

To date, 14,322 juvenile, sub-adult, and adult razorback sucker have been stocked into the Gunnison River between April 1994 and November 2000 and 29,377 juvenile and adult razorback sucker have been stocked in the Upper Colorado River between April 1994 and November 2000.

To date, 181 razorback sucker stocked in the Gunnison and Colorado rivers have either been captured (174) from sampling or have been found dead (7) during other research sampling efforts. An additional 23 razorback sucker were found dead on the upstream trash grates at the Redlands Dam fish passageway in 2000. Fish dispersement following stocking has been predominantly downstream (mean: 61.6 miles for 103 fish) from the release site indicating that hatchery-produced razorback suckers are extremely susceptible to downstream drift. The highest percent (61) of razorbacks recaptured to date has been from fish stocked between 300 and 400 mm into local rivers; the lowest (8%) has been from fish stocked less than 200 mm. Final report due February 2002.

IV. Study Schedule:

- a. initial year: 1996
- b. final year: 2002

V. Relationship to RIPRAP:

- A. Colorado River Action Plan: Mainstem and Gunnison River: IV.A.1.a.
Develop experimental augmentation [stocking] plan and seek Program acceptance.

VI. Accomplishment of FY 2000 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. FY-2000 Tasks and Deliverables: Tasks 1-3:

Task 1. Stock three groups of fish.

Task completed: three size groups stocked (8- to 12-inch razorback suckers).

Task 2. Sample Gunnison and Colorado rivers for stocked fish using various gear types.

Task completed.

Task 3. Analyze and evaluate data; prepare annual progress report.

Task completed.

B. Findings

2000--Stocking

Juvenile razorback suckers were harvested from 14 different sources in 2000, one of these being the 24 Road Hatchery. Sixty-one percent of the fish stocked into two local rivers were from the 24 Road Hatchery. Juvenile razorback sucker were stocked at one location in the Gunnison River (RM 57) and three locations in the Colorado River (RM's 227.0, 220.9 [near Parachute, CO], and 177.4 [15-mile reach]).

The numbers of razorback sucker harvested and stocked from each of these 14 sources are as follows:

<u>Source</u>	<u>Number</u>	<u>Percent</u>
19 Road Pond	355	1.09
24 Road Hatchery	19,884	61.13
29 Road Pond	2,099	6.47
Clymer's Pond	4,853	14.96
Devil's Canyon 2	155	0.48
Dike Road Pond	275	0.85

Elam Pond	247	0.76
Heuton Pond	534	1.65
<u>Source</u>	<u>Number</u>	<u>Percent</u>
Highline 1	8	0.02
Morse Pond	3,124	9.63
Peters 1	39	0.12
Peters 2	304	0.94
Peters 3	360	1.11
Peters 4	209	0.64
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Totals	32,446	100.00

A total of 6,587 juvenile razorbacks were stocked in the Gunnison River from mid-August through early-November during 2000. In the Colorado River, 25,859 juvenile razorback sucker were stocked in mid-April; and again from mid-August through late-November. The number of fish stocked per site in the Colorado River was: 2,085 fish at RM 227.0, 11,444 at RM 177.4, and 12,330 at RM 220.9. All fish stocked were PIT-tagged.

Overall, mean total length of fish stocked was 163 mm (6.4-inches). Seventy-one percent of the fish harvested and stocked were between 100 and 200 mm (4 to 8 inches) and 32% were between 110 and 130 mm (4.3-5.1-inches). Twenty-two percent of the razorback sucker were between 200 and 300 mm (8 to 12 inches) and only 0.4% were greater than 300 mm (12 inches). The range of all razorback sucker stocked in 2000 was 77-345 mm (Appendix; Figure 1). The size (length mean and range) of razorback sucker harvested and stocked from each site and date is provided in Appendix; Table 1.

Two different year classes, 1998 and 1999, were harvested from 29 Road Pond in 2000 (Appendix; Figure 2). The modal length class for the 1998 and 1999 year-classes were 240-249 mm and 120-129 mm, respectively. Over 3,000 razorback sucker were harvested from Morse Pond in 2000. A length frequency of fish harvested from this pond is provided (Appendix Figure 2).

2000--Monitoring

Four days each were expended between 1 and 4 August (37.5 electrofishing hours) and 5 and 8 September (34.1 electrofishing hours) 2000 sampling the Gunnison River from Confluence Park (river mile 57) to Redlands Diversion Dam (river mile 3) with two electrofishing craft to locate razorback sucker that had been previously stocked between 1995 and 2000. Ten razorback sucker were found during these two surveys. Eight other stocked razorback sucker were captured alive during the spring and fall

centrarchid removal project being conducted by the Grand Junction CRFP office. Another 19 were recaptured with trammel nets during May and June in an ongoing, 3-year study to estimate the population size of sub-adult and adult Colorado pikeminnow in the Upper Colorado River (Appendix; Table 2). One of these 19 razorback sucker was caught twice in the same backwater on the Colorado River (RM 154.1): once in early-May and once in early-June. Two razorback sucker, one stocked in the Gunnison River at RM 57 in early-October 1998, and another razorback sucker stocked in the Upper Colorado River near Parachute (RM 220.9) in mid-April 2000 were captured in trap nets in Gardner Pond (RM 174.4) in early-June (see RIP No. CAP-6-GP Annual Report). Gardner Pond is a former gravel-pit that was backfilled, reconfigured to drain toward the river, and has a man-made connection to the Colorado River. This site is a pilot project to determine if these type of off-channel habitats can be reconfigured to fill during runoff and benefit endangered fish and drain following runoff to prevent nonnative fish such as centrarchid fishes from proliferating. Another razorback sucker, stocked in the Gunnison River in October 1998, was captured with a trammel net in Hotspot Pond, adjacent to Gardner Pond, in early-June.

One razorback sucker was found dead by a Service biologist at the upper end of the Redlands Dam fish passageway at RM 3.0 in mid-June. Twenty-three other razorback sucker were found either dead or dying on the upstream trash grates at the Redlands Dam fish passageway between 30 August and 10 October 2000. All of these fish were from the razorback sucker stocked earlier in 2000 in the Gunnison River at river mile 57.

Four days in mid-July 2000 were spent electrofishing (31.8 hours) the Upper Colorado River from Rifle (RM 241) to Beavertail boat landing (RM 195.7) to locate razorback sucker that had been previously stocked in 1999 and April 2000. No razorback sucker or '91-year class Colorado squawfish that were stocked in late-June 2000 (see RIP No. 105 Annual Report) in the Upper Colorado River near Parachute were seen or collected.

Other razorback sucker were captured by personnel from the Colorado Division of Wildlife (69), Utah Wildlife Resources (3), and private consultants from SWCA (2). In late-summer 2000, Colorado Division of Wildlife personnel captured 64 juvenile razorback sucker in the 15-mile reach that had been stocked in the Upper Colorado River earlier. Fifty-five of these were captured on 8 September one day after being stocked on 7 September at the Corn Lake boat landing (RM 177.4). Most of these were caught about 2 miles downstream from the stocking site. Another seven razorback suckers captured on 18 September were not checked for a PIT tag because a PIT tag reader/scanner was not available. Two other razorback sucker that had been stocked near Parachute (RM 220.9), one in

mid-April and the other in late-August, were also captured by CDOW personnel on 24 August and 5 September, respectively. Seven other razorback sucker were captured during early-May to mid-June from the 18-mile, Ruby/Horsethief Canyon, and Professor Valley reaches of the Upper Colorado River by biologists conducting spring ISMP sampling and population estimates for adult Colorado pikeminnow. Two other razorback sucker were captured at RM 22.3 and RM 63.0 on the Colorado River downstream from Moab, UT.

One razorback sucker was recaptured by Utah biologists at RM 124.2 in Westwater Canyon on 24 September. This fish had been at large only 3 days since being stocked on 21 September in the Gunnison River at RM 57. In this short time, this fish moved downstream almost 104 miles. Another recapture by a Utah biologist was probably the most interesting because it documents another instance of an endangered fish moving between two major hydrologic sub-basins, the Colorado and Green. This razorback sucker was stocked in the Gunnison River at RM 57 on 4 October 1996. It's total length and weight at release were 383 mm and 574 grams, respectively. It was recaptured 3-1/2 years later at the upper most part of Labyrinth Canyon in the Green River (RM 88.9) on 18 May 2000 (TL=474mm). This fish moved 57 miles downstream in the Gunnison River, 171 miles downstream in the Colorado River to the confluence with the Green River, and then moved about 90 miles upstream in the Green River, a total of about 317 river miles.

One other razorback sucker was collected during a fall salvage operation conducted by the CDOW on 16 and 17 November 2000 to remove native fish from the Grand Valley Water User's Association canal. This razorback sucker (TL=273 mm; weight=197 grams) was collected with a seine from an isolated pool in the canal near 31 Road with several thousand other native roundtail chub, speckled dace, and flannelmouth sucker, and nonnative fishes (personal communication, Anita Martinez). Unfortunately, a PIT tag scanner/reader was not available and, therefore, the fish could not be checked for a PIT tag. Most likely, this fish was one that was stocked in the Upper Colorado River near Parachute sometime during the fall of 1999 or between mid-April and late-September 2000. This razorback sucker was transported and released alive in the Colorado River at Corn Lake (RM 177.4).

Fifteen of the 115 razorback suckers captured in 2000 either did not have a PIT tag when captured (3), a PIT-tag reader/scanner unit was not available or was inoperative to check captured fish for a PIT tag (11), or the biologist(s) failed to scan or record the PIT tag of the captured razorback (1). Therefore, no data could be obtained from these 15 fish regarding size at release or where and when they were stocked.

In summary, 115 domestic-reared that had been previously stocked in local rivers were recaptured in 2000.

Summary of Past Years Stocking

A total of 316, 4-6-inch pond-reared razorback sucker was stocked on 13 October 1995 at river mile 59.3 in the Gunnison River. In October 1996, a total of 282, 11-16-inch razorback sucker was stocked 4 October 1996 at river mile 57.0 in the Gunnison River.

In 1997, 3,732 razorback sucker were stocked in the Gunnison River at river mile 57 on nine different dates from three different sources between 12 September and 14 October. The total number, size, and number of lots of razorback sucker stocked from each of these sources were: 24-Road Hatchery (2,147, 4-12-inch; 7 lots), Clymer's Pond (1,294, 4-13-inch; 6 lots), and Wahweap Pond near Wahweap, Utah (291, 15-inch; 14 lots).

In 1998, 608 juvenile and sub-adult razorback sucker were stocked in the Gunnison River near Delta, Colorado.

In 1999, 7,735 juvenile, sub-adult, and adult razorback sucker were stocked into the Gunnison River between April 1994 and November 1999. In September and October 1999, 3,498 juvenile razorback sucker were stocked in the Upper Colorado River upstream from Parachute, Colorado (river mile 227). In addition to 20 adult razorback suckers that were stocked in the Upper Colorado River in April 1994, this marked the first juvenile razorback sucker stocked in this stream reach.

To date, 14,322 juvenile, sub-adult, and adult razorback sucker have been stocked into the Gunnison River between April 1994 and November 2000 (Table 3). In the Colorado River, 29,377 juvenile and adult razorback sucker have been in the Upper Colorado River from October 1999 to November 2000.

Summary of Recaptured Razorback Suckers

To date, 181 razorback sucker stocked in the Gunnison and Colorado rivers have either been captured (174) from sampling or have been found dead (7) during other research sampling efforts. This represents about 0.4% of all razorback suckers stocked to date in the Gunnison and Colorado rivers.

In 1999, 22 razorback sucker stocked in the Gunnison and Colorado rivers were either captured (21) or were found dead (1). In 2000, an additional 23 razorback sucker were found dead on the trash grates at the Redlands fish passageway during August, September, and October. In 1999, 72

razorbacks were found on these same grates.

Fish dispersement following stocking has been predominantly downstream of the release site. In 2000, average displacement for 43 fish was 61.6 miles downstream; average upstream movement for three fish was 31.9 miles. In 2000, the furthest downstream and upstream dispersement by a stocked razorback sucker was about 317 miles from the stocking point. This fish was found in the Green River at RM 88.9 in early-May 2000. It was stocked in the Gunnison River at RM 57 in early-October 1996. In previous years,

Table 3. Projected number of fish by size group needed to evaluate the relation between survival of razorback sucker and size at release into the river, FY96 through FY2000 and actual numbers of razorback sucker stocked, 1996 through 2000 in the Gunnison and Colorado rivers, Colorado.

Year	Stocking Location	Mean Size of Fish	Number of Fish ^a	Actual Number of Fish Stocked
Prior to FY96	Gunnison River	18-21-inch	---	25
	Colorado River	18-21-inch	---	20
FY96	Gunnison River near Delta	4-inch ^b	10,000 ^c	316
		8-inch	2,500	
		12-inch	600	
FY97	Gunnison River near Delta	4-inch	10,000	3,732
		8-inch	2,500	
		12-inch	600	
FY98 ^d	Gunnison River near Delta	4-inch	20,000	608
		8-inch	5,000	
		12-inch	1,200	
FY99	Gunnison River near Delta	4-inch	30,000	2,742
		8-inch	7,500	
		12-inch	1,800	
FY99	Colorado River near Parachute	4-inch	30,000	3,498
		8-inch	7,500	
		12-inch	1,800	
FY2000	Gunnison River near Delta	4-inch	40,000	6,587
		8-inch	10,000	
		12-inch	2,400	
FY2000	Colorado River near Parachute & 15-Mile Reach	4-inch	40,000	25,859
		8-inch	10,000	
		12-inch	2,400	

^a Number of fish may have to be adjusted depending upon the number of fish produced from paired matings, survival to stocking, and available rearing space

^b Minimum size of razorback sucker that can be safely PIT tagged

^c Numbers determined from a 75:20:5 ratio

^d Additional propagation facilities available in FY98 allowed increased production

average displacement has significantly been downstream, also (1996: 4.3 miles [7 fish]; 1997: 17.7 miles [17 fish]; 1998: 50.3 miles [15 fish]; 1999: 55.3 miles [21 fish]).

Recaptured razorback suckers are represented from various family lots from different year-classes produced. Four recaptured razorback sucker

have been from lots produced in 1992, 27 from lots in 1995, 19 from 1996, 4 from 1997, 30 from 1998, and 14 from 1999. Another 50 razorback sucker from nine, 1999 family lots were not included with the previous 1999 year-class total because they were captured only 1 day after stocking. Nine razorback sucker have been positively sighted but not netted, three in 1996, four in 1997, one each in 1998 and 2000. None of the 316, 4- to 6-inch, juvenile razorback sucker stocked in 1995 have been recaptured. Only 13 of the 2,287 juvenile razorback sucker stocked in the Gunnison River during August, September, October, and November 1999 have subsequently been collected alive during followup monitoring during other intensive, ongoing sampling programs in the Upper Colorado or Gunnison rivers.

For razorback sucker that have been at large at least six months following stocking, the 200-499 mm size class represents the majority (56; 92%) of razorback sucker recaptured alive (Table 4). Fish between 350 and 450 represent 46% of these razorback sucker recaptured. This is significant because only 15% of the total number of razorback sucker stocked (11,254) through 1999 were represented by this size class. At release, 71% of these same fish were represented from the 300-449 mm size class; 20% were from the 200-299 class and only two percent were from the 450-499 size class.

Forty-eight percent of the total number of razorback sucker stocked in the Gunnison and Colorado rivers from April 1994 to October 1999 were represented from the 150-249 mm size class. This total number includes the 45 razorback suckers collected from Etter Pond, implanted with radio transmitters, and stocked in the Gunnison and Upper Colorado rivers in April 1994.

Although data has not been examined to determine if stocking date (i. e., spring vs. summer vs. fall), influences post-stocking survival, preliminary results from razorback sucker captured in the Upper Colorado and Gunnison rivers following stocking strongly suggest that survival is related to the size of fish stocked. Razorback sucker stocked at sizes greater than 250-300 mm appear to have better short-term survival following release in the river than smaller fish stocked (< 250 mm). To date, survival of razorback sucker stocked at sizes less than 200 mm into local rivers to date appears to be very low. Only three razorback sucker smaller than 200 mm have been recaptured (for fish at large at least six months following stocking) in either the Colorado or Gunnison rivers since stocking commenced in the mid-1990's.

Table 4. Number and percentage of stocked razorback sucker by size classes (total length, mm) that have been at large for at least six months following release in the Gunnison and Colorado rivers and were captured alive. Note: the 2000 stocking of razorback suckers in the Upper Colorado and Gunnison rivers are not included below.

Size Class Total Length (mm)	Number and Percent of the Total Number of Fish Stocked Apr. 1994-Nov. 1999 ^a	Of 61 RZ's Stocked and Later Recaptured (at large for at least 6 months post-stocking)			
		Size at Release		Size at Capture	
		Number	Percentage	Number	Percentage
< 100	405 (3.6%)	0	0.0	0	0.0
100-149	1,215 (10.8%)	0	0.0	0	0.0
150-199	2,836 (25.2%)	5	8.2	3	4.9
200-249	2,611 (23.2%)	8	13.1	7	11.5
250-299	1,260 (11.2%)	4	6.6	7	11.5
300-349	1,002 (8.9%)	15	24.6	7	11.5
350-399	1,452 (12.9%)	22	36.1	12	19.7
400-449	281 (2.5%)	6	9.8	16	26.2
450-499 ^b	124 (1.1%)	1	1.6	7	11.5
500-549 ^b	68 (0.6%)	0	0.0	2	3.3
550-599	0 (0.0%)	0	0.0	0	0.0
> 600	0 (0.0%)	0	0.0	0	0.0
Total	11,254	61	100.0	61	100.0

^a total number of razorback suckers stocked into the Colorado and Gunnison rivers, April 1994 to November 1999: 11,254.

^b includes fish collected from Etter Pond in April 1994, implanted with radio transmitters, and stocked into the Upper Colorado and Gunnison rivers.

For comparison, similar results have been obtained in the San Juan River where various sizes of razorback sucker have also been stocked. The 300-450 mm size class represented 88% of the total number of stocked razorback sucker recaptured. This is even more significant when only 11% of the total number of razorback sucker stocked (5,103) prior to June 1999 were represented by this 300-450 mm size class (personal communication, Dale Ryden).

This 5-year monitoring study is nearly complete and the data collected to date strongly suggest that stocking razorback sucker smaller than 250 mm may be futile because their post-release survival in the river has been poor. In light of these data, the strategy may be to not stock razorback sucker in the river until they reach a minimum size of 250-300 mm.

Continued followup sampling to monitor the movement and long-term survival of stocked razorback sucker is critical to formulating sound recommendations to assist recovery of this species and providing direction and guidance for future propagation and stocking programs in the Upper Basin. Post-stocking sampling and monitoring will continue to collect data on dispersal and size of captured razorback suckers. These data will provide information for determining the relation between long-term survival of captive-reared razorback sucker and size at release into the

river. This will ultimately help recommend the optimum size(s) of razorback sucker to be stocked into Upper Colorado River Basin rivers.

VII. Recommendations:

- A. During the summer and early fall of FY2001, continue to sample in the Gunnison and Colorado rivers for razorback sucker stocked from 1995 to 2000 and any razorback sucker stocked in 2001. Document all recaptures of stocked razorback sucker collected during other river studies.**
- B. Stock razorback sucker in the river at a minimum of 250-300 mm.**

VIII. Project Status:

- A. Juvenile and sub-adult razorback sucker were stocked during October 1995 and 1996, September and October 1997, June and September 1998, August, September, October, and November 1999, and August, September, and November 2000 in the Gunnison River, respectively. Adult-size razorback sucker were stocked in the Gunnison River late-October 1998 and May 1999. Juvenile razorback sucker were stocked in the Upper Colorado River in September and October 1999 and in April, August, September, October and November in 2000. Monitoring to determine immediate and long-term dispersal of fish following stocking was conducted during the fall of 1995 and 1996, spring of 1996, and summer and fall of both 1997, 1998, 1999, and 2000.**
- B. Project is ongoing and is "on-track".**
- C. Final Report due February 2002.**

IX. FY 2000 Budget

- A. Funds Provided: \$49,000**
- B. Funds Expended: \$49,000**
- C. Difference: \$ 0**
- D. Status of Work--Percent of Work Completed (if BR-funded project):
100% Completed. N/A**
- E. Publication Costs: \$ 0**

X. Status of Data Submission:

Records of all PIT-tagged razorback sucker stocked in 1995, 1996, 1997, 1998, 1999, and 2000 have been computerized and are available from the UCRB database manager in Grand Junction, Colorado. Records of stocked razorback

sucker that have been subsequently captured during followup monitoring have also been computerized. These computerized records of recaptured razorbacks are provided to the UCRB database manager at his request.

XI. Signed: Bob D. Burdick 2000/12/08
Principal Investigator Date

APPENDIX:

- A. More comprehensive/final project reports. If distributed previously, simply reference the document or report.**

Burdick, B. D., R. S. Wydoski, and C. W. McAda. 1995. Stocking plan for razorback sucker in the Upper Colorado and Gunnison rivers. Final report prepared for the Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin, U. S. Fish and Wildlife Service. Denver, Colorado. 13 pp.

Burdick, B. D., and R. B. Bonar. 1997. Experimental stocking of adult razorback sucker in the Upper Colorado and Gunnison rivers. Final Report prepared for the Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin, U. S. Fish and Wildlife Service. Denver, Colorado. 28 pp. + Appendices.

- B. Attached: Appendix: two tables and two figures.**

Prepared and compiled by Bob D. Burdick, 00/12/08
RZEXSTK.00

Appendix

Table 1. Number and length statistics of razorback sucker stocked into the Gunnison (GU) and Colorado (CO) rivers, April, August, September, October, and November 2000.

Source	Stocking Location		Number of Fish Stocked	Total Length Stocked (mm)		
Date Stocked	River	River Mile		Mean	Range	n
19 Road Pond						
09/15	CO	177.4	101	192	132-270	101
09/14	CO	177.4	156	196	136-276	156
11/07	CO	177.4	98	200	109-287	98
24 Road Hatchery						
04/15	CO	227.0	2,085	118	85-194	1,029
04/19	CO	220.9	933	121	90-300	929
04/21	CO	220.9	2,042	125	77-291	2,037
08/10	CO	220.9	2,008	170	??-??	250
09/07	CO	177.4	6,330	122	113-136	??
10/12	CO	177.4	440	159	117-262	437
10/31	GU	57.1	2,104	145	104-211	1,551
11/20	CO	220.9	3,942	137	78-190	1,460
29 Road Pond						
08/21	GU	57.1	804	195	104-334	791
08/22	CO	220.9	611	178	101-334	610
08/23	GU	57.1	285	177	98-312	285
08/24	CO	220.9	137	166	88-295	134
09/25	CO	220.9	169	202	85-340	202
09/26	CO	220.9	93	201	121-317	91
Clymer's Pond						
08/24	CO	220.9	1,011	208	123-324	998
08/25	GU	57.1	381	213	164-326	380
09/11	CO	177.4	1,269	227	138-345	1,260
09/12	CO	177.4	523	225	169-328	523
09/13	CO	177.4	332	223	104-309	332
10/26	CO	177.4	339	208	102-320	339
10/27	CO	177.4	319	211	110-333	313
10/30	GU	57.1	180	213	108-300	177
10/31	GU	57.1	21	211	150-274	21
11/03	GU	57.1	478	216	129-344	477
Devils Canyon 2						
09/27& 09/28& 09/29	CO	177.4	155	197	130-280	155

Source Date Stocked	Stocking Location River River Mile		Number of Fish Stocked	Total Length Stocked (mm) Mean Range n		
Dike Road Pond						
08/23& 08/24& 08/25	GU CO GU	57.1 220.9 57.1	130 108 37	177	114-328	275
Elam Pond						
09/25& 09/26	CO	177.4	247	249	146-327	245
Heuton Pond						
10/30& 10/31& 11/01	GU	57.1	534	204	90-289	530
Highline 1						
10/27	CO	177.4	8	254	191-307	8
Morse Pond						
09/19 09/20 09/21 09/22	CO GU GU CO	220.9 57.1 57.1 177.4	1,538 877 463 246	211 205 197 197	112-328 120-308 130-358 128-313	1,525 867 458 245
Peters 1						
11/09	CO	177.4	39	219	144-284	39
Peters 2						
11/07& 11/09	CO	177.4	304	201	135-294	304
Peters 3						
11/02& 11/09	GU CO	57.1 177.4	331 29	240	150-341	358
Peters 4						
10/12	CO	177.4	209	153	108-290	209

Appendix

Table 2. Summary statistics of razorback sucker stocked in the Gunnison River, 1996, 1997, 1998, 1999, and 2000 and Upper Colorado River, 1999 and 2000, that were subsequently captured during 2000. Note: RM=river miles.

Month/ Year Stocked	Year Class & Lot No.	Total Length (mm)		Capture			Displacement (RM) From Stocking Site	
		@ Release	@ Capture	River	RM	Date	Upstream	Downstream
05/99	9521	???	460	CO	158.3	990308		69.7
10/99	9809 or 9812	235	235	CO	158.3	990308		68.7
???	???	???	150	CO	175.5	000310		??
???	???	???	235	CO	163.8	000311		?? ^a
11/99	9801	194	196	CO	164.9	000328		63.1
09/99	9803	205	210	CO	164.9	000328		62.1
11/99	9801	129	132	CO	164.9	000328		63.1
04/00	9908	130	143	CO	174.4	000601		46.5
10/96	96-3A	383	474	GR	88.9	000518	88.9	228.0
04/00	9908	130	149	CO	174.4	000421	3.4	57.0
04/00	9929	238	253	CO	176.4	000607		44.5
10/96	96-2A	387	475	CO	163.6	000605		64.4
???	???	???	207	CO	163.6	000605		??
10/98	9507	411	431	CO	174.4	000607	3.4	57.0
11/99	9801	272	313	CO	154.1	000608		73.9
11/99	9801	272	297	CO	154.1	000502		73.9
10/96	96-2A	339	427	CO	154.1	000608		73.9
09/99	9809	191	237	CO	154.1	000608		73.9
09/99	9801	219	247	CO	154.1	000608		72.9
11/99	9801	222	237	CO	154.1	000502		72.9
04/99	9929	185	194	CO	176.7	000518		44.2
04/99	9908	185	220	CO	176.7	000518		44.2
11/99	9901	219	245	CO	162.8	000504		65.2
11/99	9901	220	255	CO	162.8	000504		65.2
11/99	9901	233	277	CO	162.8	000504		65.2
11/99	9901	209	232	CO	162.8	000504		65.2
11/99	9901	208	235	CO	162.8	000504		65.2
11/99	9801	214	251	CO	22.7	000514		205.3
09/99	9801	197	232	CO	154.1	000525		66.8
10/98	9518	400	???	GU	3.0	000616		54.0 ^b
09/97	9601A	339	539	GU	20.9	000803		36.1
10/98	9520	445	458	GU	5.8	000804		51.2
09/99	9801	247	264	CO	168.7	000503		58.3
10/96	96-2A	339	416	CO	168.6	000503		59.4
09/99	9801	265	270	CO	168.3	000504		58.7
11/99	9801	261	276	CO	146.2	000510		81.8
08/00	???	143	151	GU	56.7	000905		0.3
08/00	???	182	191	GU	55.8	000905		1.2
08/00	???	210	214	GU	56.7	000905		0.3
08/00	???	245	250	GU	55.9	000905		1.1
10/96	96-2A	325	439	GU	50.3	000905		6.7
08/00	???	305	312	GU	39.7	000906		17.3
09/00	9910	212	212	CO	124.2	000924		103.8
04/00	9908	138	193	CO	176.5	000824		44.4
09/00	9910	200	197	CO	156.3	001024		71.3
???	???	???	282	CO	131.0	001023		??

Month/ Year Stocked	Year Class & Lot No.	Total Length (mm)		Capture			Displacement (RM) From Stocking Site	
		@ Release	@ Capture	River	RM	Date	Upstream	Downstream
???	???	???	493	CO	86.2	000615		??
???	???	???	417	CO	94.6	000614		??
???	???	???	187	CO	63.0	000523		??
09/99	9803	179	192	CO	169.1	000405		57.9
???	???	???	232	CO	154.1	000511		??
08/00	9911	184	190	CO	175.0	000905		45.9
09/00	1999	113-136	98-168	CO	175.0-	000908		0.2 ^c
	(9 different lots)				177.2			2.4
???	???	???	115-220	CO	177.2	000918		0.2 ^d

^a SWCA Consultants; no PIT tag reader/scanner available.

^b Mortality: found by federal sampling crews.

^c 55 fish captured by CDOW personnel one day following stocking in the 15-mile reach.

^d Seven fish captured by CDOW personnel; no PIT tag reader/scanner available.

Appendix

Figure 1. Length frequency distribution of razorback sucker harvested from 14 different sources and stocked into the Colorado and Gunnison rivers during 2000.

Appendix

Figure 2. Length frequency distribution of razorback suckers harvested from two Grand Valley ponds: 29 Road (upper) and Morse (lower) ponds and stocked in the Colorado and Gunnison rivers during August and September 2000. The 29 Road Pond represents 1998 and 1999 year classes of razorback suckers.